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Water Supply Water Footprint: How the scale impacts the assessment

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There exist several methods to quantify how water abstraction affects the freshwater resource that result in different impacts for the same area. In addition to method, the geographic scale and the demarcation of the catchment area will affect the impact assessment. The absence of a consistent and generally accepted assessment method can lead to mistrust in these assessments and make water footprints impractical. Therefore it is crucial to develop a method that obtains consistent demarcations of the area for the water footprint, in order to get a generally accepted assessment of the impact on the freshwater resource. This would give: 1) a simple tool to compare different water supplies freshwater impact and a better understanding of sustainable water abstraction and 2) start the process to find a tool that allows for implementing water in lifecycle assessments of the water supply. The purpose of this project is to investigate how the geographical scale influences the assessment of the freshwater impact, by calculating the water footprint with two different methods, on three different scales, for the utilities in Copenhagen, Aarhus, Odense and Esbjerg. The calculation are based on data of the available water resource from the River Basin Management Plans, RBMP (e.g. Miljøministeriet 2011). The applied methods are Withdrawal-To-Availability (WTA) and Water Stress Index (WSI). The assessed scales are 1) regional (e.g. Zealand), 2) River basins (540-7600 km²) and 3) a weighted average of the groundwater bodies that constitute a river basin (0.01-2737km²). The initial results show that the water footprint varies significantly depending on scale for the assessment, e.g. the WSI varies a factor 10 between the regional assessment 0.62 (Funen) and 5.99 for the weighted average of groundwater bodies in Odense Fjord River Basin. The water footprints for Odense are generally higher, up 900% compared to the other utilities. This may be due to the

administrative demarcations in the RBMPs. Since the data does not demarcate after natural water boundaries, the assessment cannot be used to compare between utilities freshwater impact.

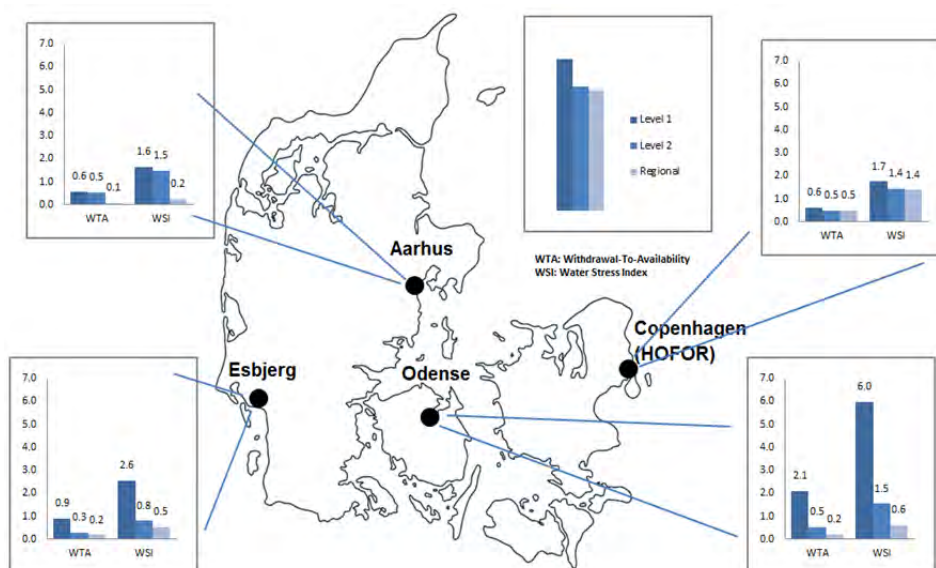


Figure 1: Water footprints for the utilities in Copenhagen, Aarhus, Odense and Esbjerg. The water footprints are found by two different methods WSI and WTA and for three scales: Regional, River basin and a weighted average of the groundwater bodies that constitute a river basin. Revised from (Hybel et al. 2015).

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